USDA
NATURAL RESOURCES
CONSERVATION SERVICE
DELAWARE
CONSERVATION
PRACTICE STANDARD

CONSERVATION COVER

CODE 327
(Reported by Acre)

DEFINITION

Establishing and maintaining perennial vegetative cover to protect soil and water resources on land retired from agricultural production or other lands requiring protective cover.

PURPOSES

This practice may be applied for one or more of the following purposes:

- Reduce soil erosion and sedimentation;
- Improve water quality;
- Create or enhance wildlife habitat.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on land retired from agricultural production or other lands requiring protective cover, including land entered into conservation programs spon-sored by USDA or other government agencies and private organizations.

This practice does not apply to:

Plantings primarily intended for forage production. (Refer to the conservation practice standard Pasture and Hayland Planting, Code 512.)

Plantings which will be established on critically eroding areas which usually cannot be stabilized by ordinary conservation treatment and management. (For site stabilization on these areas, refer to the conservation practice standard Critical Area Planting, Code 342.)

Plantings on field edges or in riparian buffers, for which other standards are applicable. (Refer to the conservation practice standards for Field Border,
Code 386; Filter Strip, Code 393; Riparian Herbaceous Cover, Code 390, and Riparian Forest Buffer, Code 391.)

CONSIDERATIONS

Consider the long-term land use objectives of the client. If the landuser is interested in providing wildlife habitat, consider the wildlife species or groups of species to be supported and the habitat needs which can be met on the managed property.

Assess site conditions including surrounding land uses, soils, residual herbicides (to the extent known), available moisture during the growing season, and existing vegetation on the site and in adjacent areas, including any noxious weeds which may be present.

Select plant species that are native, or are naturalized and are non-invasive, and have multiple values such as those suited for nesting, biomass, timber, nuts, fruit, seeds, browse, aesthetics and tolerance to locally used herbicides.

Avoid plant species which may be alternate hosts to undesirable pests or that may be considered invasive or undesirable. Species diversity should be encouraged in order to minimize problems due to species-specific pests.

Consider the adverse impacts of high populations of nuisance wildlife such as deer, groundhog, beaver, or resident geese, on the establishment and maintenance of vegetation. When feasible, select plant species which are not preferred foods of the nuisance animals, and utilize methods for protecting the plants until they become well established.

Also consider the potential for attracting

nuisance wildlife into an area, either intentionally or unintentionally. Plantings which contain preferred wildlife foods may be used to attract nuisance wildlife away from valuable agricultural crops or ornamental plantings, but may also result in attracting additional nuisance wildlife into an area.

Take note of other constraints such as economic feasibility, access, regulatory or program requirements, social effects, visual aspects.

Consider long-term maintenance requirements of the established vegetation.

Refer to the Maryland Wildlife Biology and Management Handbook for additional habitat considerations for wildlife species.

CRITERIA

Vegetative cover shall be selected to accomplish the intended purpose of the practice, conditions of the site, and the objectives of the landuser. Herbaceous and/or woody species may be appropriate.

Selection of locally native species shall be a priority when feasible. Planting recommenations shall not include non-native, invasive species.

Plantings shall consist of two or more species to provide greater vegetative diversity.

Species selected for planting shall be suited to the seasonal variation of soil moisture on the planting site. Plant types and species shall be selected based on their compatibility in growth rates, shade tolerance, and other characteristics.

Site preparation and planting to establish vegetative cover shall be done at a time and manner to insure survival and growth of selected species. See appropriate job sheet for specifics on establishment. Supplemental moisture shall be applied if and when necessary to assure early survival and establishment of selected species.

Only viable, high quality seed and planting stock shall be used. The method of planting shall include hand or machine planting techniques, suited to achieving proper depths and placement for the selected plant species.

Livestock shall be controlled or excluded as necessary to establish and maintain the vegetative cover to meet its intended purpose.

Plant and animal pest species shall be controlled as necessary to achieve and maintain the intended purpose of the vegetative cover.

Noxious weeds shall be controlled as required by state law.

Specific program requirements may dictate criteria in addition to those specified above.

SPECIFICATIONS

Plans and specifications for establishment of vegetative cover shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail concerning site preparation and establishment to ensure successful installation of the practice. Documentation shall be in accordance with the section "Supporting Data and Documentation" in this standard.

Selection of Plant Species

Select the plant species to be established from Tables 2, 3, and/or 4. These tables contain lists of herbaceous and woody plant species, including key attributes of each species, which can be used when selecting vegetative cover.

Planting Rates

For herbaceous plantings, use the seeding rates listed in Table 2. For tree and shrub plantings, use the rates listed in Table 5.

Types of Plant Materials

Vegetation may be established by using seed, bare-root seedlings, and containerized stock. Younger planting stock is generally preferred to older stock because younger plants adapt more readily to new conditions.

Proper Treatment of Plant Materials

All plant materials (seed, bare-root seedlings, and containerized stock) must be correctly handled before planting. In general, plants shall be planted as soon as possible after receiving them from the supplier. Seed shall be kept cool and dry until planted. For bare-rooted seedlings, the roots shall be kept moist at all times and the plants shall be kept out of direct sunlight as much as possible.

Recommended Planting Dates

Use Figure 1 and Table 1 to determine the appropriate planting dates for the different types of plant materials.

ESTABLISHMENT AND MAINTENANCE

Follow the guidance provided in Delaware Job Sheet for warm season grass plantings, Job Sheet for cool season grass plantings and Job Sheet for tree and shrub plantings. The completed Job Sheet(s) will serve as the operation and management plan as well as supporting documentation and shall be provided to the client. If necessary, additional management requirements can be developed on a site-specific basis to assure performance of the practice as intended.

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file:

1. Completed copy of the appropriate Job Sheet(s), including species selected and spacing, or appropriate documenation, and management plan. Document species established and planting rates.

2. Field location and extent of planting in acres. Also note the location of the planting on the conservation plan map.

REFERENCES

1. Fish and Wildlife Service, Chesapeake Bay Field Office with the Natural Science Center and Adkins Arboretum, 1995. Native Plants for Wildlife Habitat. Annapolis, MD.

2. Natural Resources Conservation Service, Conservation Practice Standard for Critical Area Planting (Code 342).

3. Natural Resources Conservation Service, Conservation Practice Standard for Field Border (Code 386).

4. Natural Resources Conservation Service, Conservation Practice Standard for Filter Strip (Code 393).

5. Natural Resources Conservation Service, Conservation Practice Standard for Pasture and Hayland Planting (Code 512).

6. Natural Resources Conservation Service, Conservation Practice Standard for Riparian Forest Buffer (Code 391).

7. Natural Resources Conservation Service, Conservation Practice Standard for Riparain Herbaceous Cover (Code 390).

8 Natural Resources Conservation Service, Maryland Wildlife Biology and Management Handbook.

9. Natural Resources Conservation Service & Duck Unlimited Canada, Vegetating with Native Grasses in Northeastern North America.

FIGURE 1: USDA Plant Hardiness Zones for Delaware

Plant Hardiness Zones delineate areas where a species can be successfully established based on average annual minimum temperatures.

TABLE 1: Recommended Planting Dates for Delaware

Type of Plant Material		Plant Hardiness Zones	
		6b	**7a and 7b**
Grasses:	Cool-Season Seeds	Mar 1 to Apr 30 Aug 1 to Oct 15	Feb 1 to Apr 30 Aug 15 to Nov 30
	Warm-Season Seeds	Apr 1 to Jun 15 *Jun 15 to Jun 30**	Mar 15 to May 31 *Jun 1 to Jun 30**
Legumes:	Seeds	Mar 1 to Apr 30 Aug 1 to Oct 15	Feb 1 to Apr 30 Aug 15 to Nov 30
Forbs:	Seeds	Mar 1 to Apr 30	Feb 1 to Apr 30
	Bare-Root Seedlings	Mar 15 to May 15 *May 16 to Jun 30**	Feb 15 to Apr 30 *May 1 to Jun 30**
	Containerized Stock	Mar 15 to May 15 *May 16 to Jun 30** *Sep 15 to Oct 15**	Mar 1 to Apr 30 *May 1 to Jun 30** *Oct 1 to Nov 15**
Woody Plants:	Dormant Cuttings	Feb 15 to Mar 15 Nov 15 to Nov 30	Feb 1 to Feb 28 Nov 15 to Nov 30
	Bare-Root Seedlings	Mar 15 to May 15 *May 16 to Jun 30**	Mar 1 to Apr 30 *May 1 to Jun 30**
	Containerized Stock	Mar 15 to May 15 *May 16 to Jun 30** *Sep 15 to Oct 15**	Mar 1 to Apr 30 *May 1 to Jun 30** *Oct 1 to Nov 15**

Note: *Dates listed in italics are additional planting dates during which supplemental watering may be needed to ensure plant establishment.

TABLE 2: Herbaceous Cover

Mix	Recommended Cultivar	Seeding Rate (lbs/ac)	Plant Hardiness Zone	Soil Drainage Class	Max. Height (feet)	All Native Species	Plant Type	Remarks
1. Switchgrass *Panicum virgatum*	Shelter	1 - 2						
Eastern Gamagrass *Tripsacum dactyloides*	Pete	3 - 4	All					
Coastal Panicgrass OR *Panicum amarum*	Atlantic	2 – 3	(See Remarks)	W - SP	6 - 8	Y	Warm & Cool-season grasses	Plant with a regular grass drill. Use dates for warm season grasses. Coastal Panicgrass PHZ 7b.
Red Fescue *Festuca rubra*	Common	2 - 4						
2. Big Bluestem *Andropogon gerardii*	Niagara or Rountree	2 - 4						
Switchgrass *Panicum virgatum*	Shelter	1 - 3	All	E - MW	6 - 8	Y	Warm-season grasses	Use a native seed drill.
Indiangrass *Sorghastrum nutans*	Rumsey	2 - 4						
3. Indiangrass *Sorghastrum nutans*	Rumsey	2 - 3						
Big Bluestem *Andropogon gerardii*	Niagara or Roundtree	2 - 3	All	E - MW	6 - 8	Y	Warm-season grasses	Use a native seed drill.
Little Bluestem *Schizachyrium scoparium*	Aldous or Blaze	1 - 2						
4. Switchgrass *Panicum virgatum*	Shelter	1 - 2						
Indiangrass *Sorghastrum nataus*	Rumsey	1 - 2						
Big Bluestem *Andropogon gerardii*	Niagara or Rountree	1 - 2	All	E - MW	6 - 8	Y	Warm season grasses and legume	Use a native seed drill.
Coastal Panicgrass *Panicum amarum*	Atlantic	2 – 3						
5. Switchgrass *Panicum virgatum*	Shelter	2 - 3	All	E - W	6 - 8	Y	Warm-season grasses	Plant with a regular grass drill.
Coastal Panicgrass *Panicum amarum*	Atlantic	4 – 5						

TABLE 2: Herbaceous Cover

Mix	Recommended Cultivar	Seeding Rate (lbs/ac)	Plant Hardiness Zone	Soil Drainage Class	Max. Height (feet)	All Native Species	Plant Type	Remarks
6. Deertongue *Dicanthelium clandestinum* Virginia Wild Rye *Elymus virginicus* Red Fescue *Festuca rubra* OR Little Bluestem *Schizachyrium scoparium*	Tioga Common Common Aldous	1 – 2 2 – 3 3 – 4 2 – 3	All	E – SP (See remarks)	3 – 4	Y	Warm & cool season grasses	Low growing native mix. Use Little Bluestem on drier soils and Red Fescue on wetter soils.
7. Red Fescue *Festuca rubra* Switchgrass *Panicum virgarum*	Common Shelter	6 –10 2 – 4	All	E - SP	4 - 6	Y	Cool & warm season grasses	Must add Mixture 8 if planted for wildlife purposes. Use warm season grass planting dates.

TABLE 2: Herbaceous Cover

Mix	Recommended Cultivar	Seeding Rate (lbs/ac)	Plant Hardiness Zone	Soil Drainage Class	Max. Height (feet)	All Native Species	Shade Tolerance	Remarks
8. Wildflower and Legume Mix Select at least 3 wildflowers and 1 legume from below. Legumes should not comprise more than 25% of the total mix. Add this mix to Mixes 1 - 7 for added wildlife and aesthetic value.		1/4-1/2						Flower Color
Wildflowers: Black-eyed Susan *Rudbeckia hirta*			All	W - MW	1-2	Y	❍	Yellow
Blazing Star *Liatris spicata*			All	W - SP	2-5	Y	❍ - ◗	Pink-Lavender
Boneset *Eupatorium perfoliatum*			All	SP –P	2-4	Y	❍ - ◗	White
Butterflyweed *Asclepias tuberosa*			All	W - MW	1-2	Y	❍	Bright Orange
Heath Aster *Aster pilosus*			All	E - MW	2-5	Y	❍	Light Purple
Joe-Pye Weed *Eupatorium fistulosus*			All	SP – P	4-6	Y	❍ - ◗	Pink-Purple
New York Aster *Aster novi-belgii*			All	MW - P	3-5	Y	❍	Violet
New York Ironweed *Vernonia noveboracensis*			All	MW - P	5-8	Y	❍	Purple
New York Aster *Aster novi-belgii*			All	MW - P	3-5	Y	❍	Violet
Rough Goldenrod *Solidago rugosa*			All	SP – P	2-6	Y	❍ - ◗	Yellow
Tickseed *Coreopsis tinctoria*			All	W - MW	2-3	Y	❍	Yellow
Wild Bergamont *Monarda fistulosa*			All	W - SP	2-4	Y	❍ - ◗	Lavender
Wild Blue Indigo *Baptisia australis*			All	W - MW	3-5	Y	❍	Blue
Wild Columbine *Aquilegia canadensis*			All	W - MW	1-2	Y	❍ - ◗	Scarlet
Legumes: Bush Clover *Lespedeza capitata*			All	E - MW	2-4	Y	❍	White to Yellow
Hairy Bush-Clover *Lespedeza hirta*			All	E - MW	2-4	Y	❍	White to Yellow
Partridge Pea *Chamaecrista fasciculata*			All	W - SP	2-3	Y	❍ - ◗	Yellow

TABLE 2: Herbaceous Cover

Mix	Recommended Cultivar	Seeding Rate (lbs/ac)	Plant Hardiness Zone	Soil Drainage Class	Max. Height (feet)	All Native Species	Plant Type	Remarks
9. Orchardgrass *Dactylis glomerata*	Any	3 - 6	All	W - MW	2 - 3	N	Cool-season grasses with legumes	Can be used for: FIREBREAK
Red Fescue *Festuca rubra*	Common	3 - 4						
Alsike Clover *Trifolium hybridum*	Common	1 - 2						
White Clover *Trifolium repens*	Common	1 - 2						
10. Orchardgrass *Dactylis glomerata*	Any	4 - 6	All (See remarks)	W - MW	2 - 3	N	Cool-season grasses and legumes	Timothy does not perform well in zones 7a and 7b. Can be used for: FIREBREAK
Bluegrass *Poa pratensis* AND/OR	Not a turf type	2 - 4						
Timothy *Phleum pratense*	Climax	4 - 6						
AND ONE OF THE FOLLOWING:								
White Clover *Trifolium repens*	Common	1 - 2						
Red Clover *Trifolium pratense*	Any	1 - 2						
Common Lespedeza *Lespedeza striata*	Kobe	3 - 5						
Korean Lespedeza *Lespedeza stipulacea*	Climax or Rowan	3 - 5						
11. Chewings Fescue *Festuca rubra ssp. falax*	Common	3 - 6	All	W - MW	0.5 - 1	N	Cool-season grasses	Must add Mixture 8 if planted for wildlife food and cover purposes. Can be used for: FIREBREAK PATHS COMPANION PLANTING
Hard Fescue *Festuca trachyphylla*	Attila or Aurora	3 - 6						
Sheep Fescue *Festuca ovina*	Bighorn	3 - 6						

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Mix	Recommended Cultivar	Seeding Rate (lbs/ac)	Plant Hardiness Zone	Soil Drainage Class	Max. Height (feet)	All Native Species	Plant Type	Remarks
12. Sheep fescue *Festuca ovina*	Common or Bighorn	4 - 8	All	W - MW	2 - 3	N	Cool-season grasses, forbs, and legume	Attractive, low-growing wildflower mix. Use cool season grass planting dates for this mix.
Hard Fescue *Festuca trachyphylla*	Attila or Aurora	4 - 8						
Black-eyed Susan *Rudbeckia hirta*	Common	1/8 - 1/4						
Lance-leaved Coreopsis *Coreopsis lanceolata*	Common	1/8 - 1/4						
Partridge Pea *Chamaecrista fasciculata*	Common	1 - 2						
Purple Coneflower *Echinacea purpurea*	Common	1/8 - 1/4						
13. Rough Bluegrass *Poa trivialis*	Common	4 - 8	All	SP - P	4 - 5	N	Cool-season grasses	Can be used for: FIREBREAK
Chewings Fescue *Festuca rubra ssp. falax*	Common	3 - 6						
Alsike Clover *Trifolium hybridum*	Common	1 – 2						
White Clover *Trifolium repens*	Common	1 - 2						
14. Fowl Meadowgrass *Poa palustris*	Common	2 - 4	All	SP - P	4 - 5	N	Cool-season grasses	Can be used for: FIREBREAK
Virginia Wild Rye *Elymus virginicus*	Common	1 - 2						
Red Fescue *Festuca rubra*	Common	2 - 4						
Alsike Clover *Trifolium hybridum*	Common	1 - 2						
White Clover *Trifolium repens*	Common	1 - 2						

TABLE 2: Herbaceous Cover

Mix	Recommended Cultivar	Seeding Rate (lbs/ac)	Plant Hardiness Zone	Soil Drainage Class	Max. Height (feet)	All Native Species	Plant Type	Remarks
15. Sideoats Grama *Bouteloua curtipendula*	(see remarks)	2 - 3	All	EW - W	2 - 3	Y*	Warm season grasses and forbs	No eastern cultivars of sideoats grama have been released. Midwest varieties such as El Reno, Butte, Pierre, and Trailway reportedly have been used in parts of the Northeast. Broomsedge seed is quite expensive ($40-$50 per pound PLS).
Little Bluestem *Schizachyrium scoparium*	Aldous	3 - 4						
Broomsedge *Andropogon virginicus*	Common	1 - 2						
OR								
Deertongue *Dicanthelium clandestinum*	Tioga	1 - 2						

Soil Drainage Class:
E - Excessively Drained
W - Well Drained
MW - Moderately Well Drained
SP - Somewhat Poorly Drained
P - Poorly Drained

Sun - Shade:
❍ Full Sun - 6 or more hours of light per day or 4 hours of midday sun
◗ Part Shade - 3 to 6 hours of light per day
● Shade - less than 3 hours of light per day

TABLE 2 - NOTES:

1. This table provides seed mixes of native and introduced species to meet the conservation cover purposes of erosion control, water quality, and wildlife habitat enhancement.

2. When a seeding rate is expressed as a range (i.e., 4 - 6), the lower rate should be used if erosion is not a concern.

3. Where erosion is a concern, use the higher seeding rate and add one of the following nurse crops with the selected mix: 20 - 40 lbs/ac oats, barley, or cereal rye. This can be planted with the selected mix at the time of seeding. If using a conservation tillage method, plant the nurse crop in the fall, mow in early spring, and drill into the remaining stubble.

4. Seeding rates for warm season-grasses are in pounds of pure live seed.

5. The term "native" refers to species that occur naturally in the state of Delaware. Native mixes may include non-native nurse crops (which are short-lived) for site stabilization during establishment of the permanent planting. Due to page limitations, this listing of native species is not all-inclusive. There are more native plants which occur in Delaware and may be suitable for use in conservation plantings.

6. All legume seed should be inoculated before planting.

TABLE 2 - ADDITIONAL REMARKS:

FIREBREAK - Mix can be used as a firebreak around warm-season grass plantings when controlled burning will be used for management.

PATHS - Mix provides a low growing, low maintenance planting suitable for pathways and walkways which will receive light to moderate use.

COMPANION PLANTING - Mix provides a non-competitive planting that can be used for erosion control in conjunction with tree and shrub plantings

TABLE 3: Trees

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Height at 20 Years	Wildlife Value for Food	Remarks
DECIDUOUS TREES						
ASH, GREEN *Fraxinus pennsylvanica*	All	Statewide.	SP -P	35'	Medium: seeds eaten by ducks, gamebirds, songbirds, squirrels; browsed by deer.	Naturally occurring on streambanks and floodplains.
ASH, WHITE *Fraxinus americana*	All	Statewide.	W - SP	35'	Medium: seeds eaten by ducks, gamebirds, songbirds, squirrels; browsed by deer.	Important lumber tree. Attractive fall color (yellow to maroon).
BALDCYPRESS *Taxodium distichum*	All	Coastal Plain	MW - P	30'	Low: seeds eaten by ducks and marsh birds.	Naturally occurring on streambanks and in swamps.
BIRCH, RIVER *Betula nigra*	All	Mostly Coastal Plain; Piedmont at lower elevations.	W - P	30'	Low: seeds eaten by ducks and songbirds.	Unique peeling reddish bark. Naturally occurring in riparian areas and floodplains.
BLACKGUM *Nyssa sylvatica*	All	Statewide.	W - P	30'	Medium: fruits eaten by squirrels, quail, turkey, and songbirds; browsed by deer.	Foliage turns bright red in early fall.
CHERRY, BLACK *Prunus serotina*	All	Statewide.	W - SP	35'	High: fruits eaten by songbirds, grouse, turkey, quail; browsed by rabbits and deer.	Leaves and branches are poisonous if eaten by livestock.
DOGWOOD, FLOWERING *Cornus florida*	All	Statewide.	W - SP	20'	High: berries eaten by songbirds, grouse, turkey, quail, squirrels; browsed by deer, rabbits.	White flowers and red fruit. Widely planted as an ornamental.

TABLE 3: Trees

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Height at 20 Years	Wildlife Value for Food	Remarks
HACKBERRY *Celtis occidentalis*	All	Statewide.	W - SP	30'	High: fruits eaten by quail, turkey, and songbirds.	Adaptable to a wide range of conditions.
HICKORY, MOCKERNUT *Carya tomentosa*	All	Statewide.	W – MW	35'	High: nuts eaten by squirrels, chipmunks, bluejays, deer.	High btu for firewood, woods used for tool handles, yellow fall foliage.
HICKORY, PIGNUT *Carya glabra*	All	Statewide.	W – MW	35'	High: nuts eaten by squirrels, chipmunks, bluejays, deer.	High BTU for firewood, woods used for tool handles, yellow fall foliage.
HICKORY, SHAGBARK *Carya ovata*	All	Piedmont.	W - SP	30'	High: nuts eaten by squirrels, turkey, quail, deer.	Wood used for furniture, tool handles, charcoal.
MAPLE, RED *Acer rubrum*	All	Statewide.	W - P	35'	Medium: seeds eaten by ducks, gamebirds, songbirds, squirrels; browsed by deer.	Red fall color and blooms.
OAK, CHESTNUT *Quercus prinus*	All	Mostly Piedmont; infrequent on Coastal Plain.	W - MW	35'	High: acorns eaten by quail, turkey, grouse, squirrels, and deer.	Grows well on dry, rocky, or gravelly soils.
OAK, CHINQUAPIN *Quercus muehlenbergii*	6b, 7a, 7b	Piedmont.	W - MW	35'	High: acorns eaten by quail, turkey, grouse, squirrels, and deer.	Under used, native tree. Usually found on dry, limestone outcrops.
OAK, OVERCUP *Quercus lyrata*	6b, 7a, 7b	Piedmont.	SP - P	25'	High: same as above.	Important lumber tree. Withstands flooding.
OAK, PIN *Quercus palustris*	All	Statewide.	MW - P	35'	High: same as above.	Bronze or red fall foliage. Widely planted as an ornamental. Produces small acorns.
OAK, NORTHERN RED *Quercus rubra*	All	Mostly Piedmont; uncommon on Coastal Plain.	W - SP	35'	High: same as above.	Excellent red fall color. Fast growing.

TABLE 3: Trees

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Height at 20 Years	Wildlife Value for Food	Remarks
OAK, SOUTHERN RED *Quercus falcata*	7a, 7b	Mostly Coastal Plain; infrequent elsewhere.	W - SP	35'	High: same as above.	Excellent red fall color. Tolerates poor, dry soil.
OAK, SWAMP CHESTNUT *Quercus michauxii*	All	Mostly Coastal Plain; infrequent elsewhere.	SP - P	30’	High: same as above.	Good choice for wet sites; important lumber tree
OAK, SWAMP WHITE *Quercus bicolor*	All	Mostly Coastal Plain; infrequent elsewhere.	SP - P	30'	High: same as above.	Good choice for wet sites; important lumber tree. Requires acid soils.
OAK, WILLOW *Quercus phellos*	All	Mostly Coastal Plain; infrequent elsewhere.	MW - P	30'	High: same as above.	Frequently used as an ornamental planting. Produces small acorns. Red fall color.
OAK, WHITE *Quercus alba*	All	Statewide.	W - SP	35'	High: same as above.	Variable fall color, stately tree. Important lumber tree. Slow growing.
REDBUD *Cercis canadensis*	All	Mostly Piedmont; infrequent elsewhere.	MW - SP	20'	Low: seeds eaten by quail, pheasants, and deer.	Nitrogen-fixing. Useful as an ornamental. Bright pink flowers, appearing in early spring before the leaves.
SWEETGUM *Liquidambar styraciflua*	6b, 7a, 7b	Mostly Coastal Plain; infrequent elsewhere.	MW - P	40'	Low: seeds eaten by songbirds, squirrels, and chipmunks.	Excellent yellow-red fall color. Widely planted as an ornamental. Fallen seed heads are a nuisance on lawns. Fruitless types are available.

TABLE 3: Trees

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Height at 20 Years	Wildlife Value for Food	Remarks
SYCAMORE *Platanus occidentalis*	All	Statewide; infrequent at higher elevations of the Piemont.	MW - SP	40'	Low: seeds eaten by songbirds and squirrels.	Unique peeling bark, fast growth rate. Good den tree. Naturally occurring on streambanks and floodplains.
TULIPTREE *Liriodendron tulipifera*	All	Statewide.	W - SP	40'	Low: seeds eaten by squirrels and songbirds; seedlings browsed by deer.	Important lumber tree. Fast growing. Flowers produce abundant nectar, used extensively by bees.
WALNUT, BLACK *Juglans nigra*	All	Mostly Piedmont; infrequent elsewhere.	MW - SP	40'	Low: nuts eaten by squirrels.	Very important lumber tree. Valuable for furniture and nut production.
WILLOW, BLACK *Salix nigra*	All	Statewide.	SP -P	60'	Medium: browsed by grouse, beaver, and deer.	Naturally occurring on streambanks and floodplains. Fast growth rate. Can be invasive.

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Height at 20 Years	Wildlife Value for Food	Remarks
EVERGREEN TREES						
ATLANTIC WHITE-CEDAR *Chamaecyparis thyoides*	All	Coastal Plain; uncommon.	SP - P	25'	Low: seeds eaten by songbirds and deer.	Cannot compete with hardwoods; best planted in solid stands.
EASTERN REDCEDAR *Juniperus virginiana*	All	Mostly Piedmont.	W - SP	20'	Medium: seeds eaten by songbirds, quail, turkey; browsed by deer and rabbits.	Should not be planted near apple orchards; alternate host of cedar-apple rust.
HOLLY, AMERICAN *Ilex opaca*	All	Mostly Coastal Plain.	W - P	20'	Medium: fruits eaten by songbirds, quail, and squirrels.	Need male and female plants for fruit production. Shade tolerant.
PINE, LOBLOLLY *Pinus taeda*	All	Mostly Coastal Plain.	MW - P	45'	Medium: seeds eaten by songbirds, quail, turkey; browsed by deer and rabbits.	Important lumber tree on Coastal Plain; fast growth rate.
PINE, WHITE *Pinus strobus*	All	Mostly Piedmont.	W - MW	40'	Medium: seeds eaten by songbirds, quail, turkey; browsed by deer and rabbits.	Frequently planted statewide as an ornamental.
PINE, VIRGINIA *Pinus virginiana*	All	Statewide.	W - MW	30'	Medium: seeds eaten by songbirds, quail, turkey; browsed by deer and rabbits.	Can be used for pulpwood. Tolerant of adverse site conditions.

Soil Drainage Class:
E - Excessively Drained
W - Well Drained
MW - Moderately Well Drained
SP - Somewhat Poorly Drained
P - Poorly Drained

TABLE 3 - NOTES:

1. All species listed in this table are "native," i.e., they occur naturally in the state of Delaware. Due to page limitations, this listing of native species is not all-inclusive. There are many more native plants which occur in Delaware and may be suitable for use in conservation plantings.

2. The plant hardiness zones designate where a species can be successfully planted in Delaware, while the geographic distribution describes where the species usually occurs under natural conditions.

TABLE 4: Shrubs

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Shade Tolerance	Height at 20 years	Wildlife Value for Food	Remarks
ALDER, SMOOTH *Alnus serrulata*	All	Statewide; less common on Coastal Plain.	SP - P	❍ - ◗	10'	Medium: seeds eaten by ducks, quail, doves; browsed by deer, beaver.	Nitrogen-fixing. Attractive catkins. Provides good cover for woodcock.
ARROWWOOD *Viburnum dentatum*	All	Statewide.	W - P	❍ - ◗	10'	Medium: berries eaten by turkey, grouse, songbirds, squirrels; browsed by rabbits, deer.	Suckers freely; wood used to make arrows. White flowers, bluish-black berries.
BAYBERRY, NORTHERN *Myrica pensylvanica*	6b, 7a, 7b	Coastal Plain.	W - SP	❍ - ◗	10'	Medium: berries eaten by quail, songbirds. Browsed by deer.	Need male and female plants for fruit production. Salt tolerant. Suckers to form colonies. Wax of berries used in candles.
BLACK-HAW *Viburnum prunifolium*	All	Statewide.	W - SP	❍ - ◗	12'	Medium: berries eaten by turkey, grouse, songbirds, squirrels; browsed by rabbits, deer.	White flower clusters, blue berries, red fall color. Fruits may remain on shrubs for much of the winter.
BLUEBERRY, HIGHBUSH *Vaccinium corymbosum*	All	Coastal Plain.	MW - P	❍ - ◗	10'	High: berries eaten by songbirds, turkey, squirrel; browsed by deer, rabbits.	Prefers acid soils. Slow growing.
BUTTONBUSH *Cephalanthus occidentalis*	All	Statewide.	SP - P	❍ - ◗	8'	Medium: seeds and nectar; food for hummingbirds, ducks, beavers, and rails; browsed by deer.	Unusual, round white flowers. Tolerates flooding and ponding. Prefer permanent saturation.

TABLE 4: Shrubs

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Shade Tolerance	Height at 20 years	Wildlife Value for Food	Remarks
CHOKEBERRY, RED *Aronia arbutifolia*	All	Statewide; less common in the Piedmont.	MW - P	❍ - ◗	10'	Medium: fruits eaten by songbirds, grouse, bear, squirrel; browsed by deer, rabbits.	Fruits may remain on shrubs for much of the winter. Tends to sucker.
CRANBERRY BUSH *Viburnum trilobum*	All	Mostly Piedmont.	MW - P	❍ - ◗	12'	Medium: berries eaten by turkey, grouse, songbirds, squirrels; browsed by rabbits, deer.	Yellow to red fall color; white flower clusters. Bright red berries.
DOGWOOD, GRAY *Cornus racemosa*	All	Mostly Piedmont.	MW - SP	❍ - ◗	10'	High: berries eaten by songbirds, grouse, turkey, quail, squirrels; browsed by deer, rabbits.	White flowers, white berries with red pedicels. Forms thickets which can provide good wildlife cover.
DOGWOOD, REDOSIER *Cornus sericea*	All	Statewide; uncommon.	MW - P	❍ - ◗	8'	High: berries eaten by songbirds, grouse, turkey, quail, squirrels; browsed by deer, rabbits.	Good for streambank stabilization. Attractive red stem color. White flowers and fruit.
DOGWOOD, SILKY *Cornus amomum*	All	Common on Coastal Plain & Piedmont.	MW - P	❍ - ◗	10'	High: berries eaten by songbirds, grouse, turkey, quail, squirrels; browsed by deer, rabbits.	Produces fruit at 3-5 years of age. White flowers with blue berries. Prefers some shade.
ELDERBERRY *Sambucus nigra ssp. Canadensis (formally S. canadensis)*	All	Statewide.	MW - P	❍ - ◗	12'	High: berries eaten by songbirds, turkey, squirrels; browsed by deer, rabbits.	Large clusters of white flowers followed by purple berries; fast growth rate. Suckers freely.

TABLE 4: Shrubs

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Shade Tolerance	Height at 20 years	Wildlife Value for Food	Remarks
FETTERBUSH *Leucothoe racemosa*	All	Mostly Coastal Plain; common	SP – P	❍ - ◗	12'	Low: seeds eaten by songbirds. Plants browsed by deer.	Small white flowers in drooping racemes. Prefers permanent saturation.
INKBERRY *Ilex glabra*	All	Coastal Plain	SP – P	❍ - ◗	10'	Medium: Berries eaten by songbirds, quail, and squirrels	Black fruits persist during the winter. Extensive rhizomes, often forms colonies. Prefers permanent saturation.
NANNYBERRY *Viburnum lentago*	6b	Mostly Piedmont.	W - P	❍ - ◗	20'	Medium: berries eaten by turkey, grouse, songbirds, squirrels; browsed by rabbits, deer.	Often suckers. Creamy white flowers. Berries are blue-black.
PAWPAW *Asimina triloba*	All	Statewide; infrequent.	MW - P	❍ - ◗	20'	High: important food source for fox,raccoon, and opossum.	Suckers and forms colonies. Purple flowers; large yellow fruit.
PEPPERBUSH, SWEET *Clethra alnifolia*	All	Coastal Plain.	MW - P	❍ - ◗	8'	Medium: nectar for butterflies,other insects.	Showy, fragrant white flower spikes in mid-summer, often when other flowers & nectar are less abundant.
POSSUM-HAW *Viburnum nudum*	All	Mostly Coastal Plain.	SP - P	❍ - ◗	12'	Medium: berries eaten by turkey, grouse, songbirds, squirrels; browsed by rabbits, deer.	White flower clusters, red berries, red fall color. Fruits may remain on shrubs for much of the winter.

TABLE 4: Shrubs

Plant Names	Plant Hardiness Zone	Geographic Distribution in Delaware	Soil Drainage Class	Shade Tolerance	Height at 20 years	Wildlife Value for Food	Remarks
RAISIN, WILD *Viburnum cassinoides*	All	Mostly Piedmont.	SP - P	❍ - ◗	8'	Medium: berries eaten by turkey, grouse, songbirds, squirrels; browsed by rabbits, deer.	White flower clusters, black berries. Fruits may remain on shrubs for much of the winter. Reddish-purple foliage in fall.
ROSE, SWAMP *Rosa palustris*	All	Statewide: more common on Coastal Plain	SP – P	❍ - ◗	6'	Low: Fruits eaten by songbirds. Plants browsed by deer.	Pink flowers, red fruits. Fruits may remain for much of the winter. Prefers permanent saturation.
SPICEBUSH *Lindera benzoin*	All	Statewide.	MW - P	❍ - ◗	12'	Low: berries eaten by songbirds.	Fragrant leaves and twigs; yellow fall color. Bright red berries.
SWEETSPIRE, VIRGINIA *Itea virginica*	All	Coastal Plain	SP – P	❍ - ◗	8'	Low: flowers attractive to butterflies.	Small white flowers in elongated clusters up to 6 inches long. Prefers permanent saturation.
WAXMYRTLE, SOUTHERN *Myrica cerifera*	7a, 7b	Coastal Plain.	W - SP	❍ - ◗	10'	Medium: berries eaten by quail, songbirds. Browsed by deer.	Need male and female plants for fruit production. Salt tolerant. Wax of berries used in candles.
WITCH-HAZEL *Hamamelis virginiana*	All	Statewide; less common on Coastal Plain.	W - SP	❍ - ◗	15'	Low: seeds eaten by grouse and squirrels; browsed by deer.	Bark is used for making witch-hazel lotion. Fragrant yellow flowers.
WINTERBERRY *Ilex verticillata*	All	Statewide; less common on Coastal Plain.	SP - P	❍ - ◗	10'	Medium: fruits eaten by songbirds, quail, and squirrels.	Need male and female plants for fruit production. Bright red berries persist after leaves drop.

Soil Drainage Class:
E - Excessively Drained
W - Well Drained
MW - Moderately Well Drained
SP - Somewhat Poorly Drained
P - Poorly Drained

Sun - Shade:
❍ Full Sun - 6 or more hours of light per day or 4 hours of midday sun
◗ Part Shade - 3 to 6 hours of light per day
● Shade - less than 3 hours of light per day

TABLE 4 - NOTES:

1. All species listed in this table are "native," i.e., they occur naturally in the state of Delaware. Due to space limitations, this listing of nataive species is not all-inclusive. There are many more native plants which occur in Delaware and may be suitable for use in conservation plantings.

2. The plant hardiness zones designate where a species can be successfully planted in Delaware, while the geographic distribution describes where the species usually occurs under natural conditions.

TABLE 5: Planting Rates for Trees, Shrubs, and Tree & Shrub Mixes

Step 1: Identify the primary purpose of the planting and its associated establishment goal. The establishment goal is the number of trees and/or shrubs expected to survive two years after planting.

Step 2: Determine the planting rate based on the type of planting stock used and the expected survival rate. (For more details, refer to the Note at the end of this table). Use the information listed below as a guide to determine the number of plants needed per acre.

Primary Purpose	Establishment Goal (number of trees and/or shrubs per acre after two years)	Type of Planting Stock	Planting Rate (per acre)	Number of Plants Needed (per acre) for Standard Spacings (in feet)	Remarks
Create or Enhance Wildlife Habitat	200 - 300	Bare-root seedlings	308 - 462	363 plants at 10 x 12 436 plants at 10 x 10	Where trees and/or shrubs will be used to provide wildlife cover within or adjacent to herbaceous areas, they should be planted in groups so that the woody cover area is at least 20 feet wide and at least 400 sq. ft. in size.
		Containerized (1 gallon or larger)	211 - 316	302 plants at 12 x 12	
Reduce Soil Erosion and/or Improve Water Quality	300 - 400	Bare-root seedlings	462 - 615	544 plants at 8 x 10	Recommend using Mix 11 from Table 2 as a ground cover on highly erodible land and on other land where erosion is a concern.
		Containerized (1 gallon or larger)	316 - 421	363 plants at 10 x 12	

TABLE 5 - NOTE:
The planting rate is determined by dividing the establishment goal by the expected survival rate. For example, if the establishment goal is 300 - 400, and the expected survival rate is 65% (0.65), then the planting rate is 462 - 615. The planting rates in this table are based on estimated survival rates of 65% for bare-

root seedlings and 95% for containerized stock. It may be necessary to adjust planting rates if survival is expected to be significantly different than the 65% or 95% rates.